

## **AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions and listings of claims in the application:

1-20. (Cancelled)

21. (New) A pyridopyrimidine or a naphthyridine compound of the formula (I):

wherein

R<sup>1</sup> is a nitrogen-containing heterocyclic group which is optionally substituted by

- (i) a lower alkyl group optionally substituted by a group selected from the group consisting of a hydroxy group, a halogen atom and a lower alkoxy group;
- (ii) an amino group which is optionally substituted by a group selected from the group consisting of a lower alkyl group optionally substituted by a heteroaryl group, a lower alkyl group optionally substituted by an aryl group, and a lower alkoxy group; or
- (iii) an alkoxy group which is optionally substituted by (1) an aryl group optionally substituted by a group selected from the group consisting of a hydroxy group, a halogen atom and a lower alkoxy group, or (2) a lower alkyl group optionally substituted by a heteroaryl group which may be optionally substituted by a group selected from the group consisting of a hydroxy group, a halogen atom and a lower alkoxy group;

R<sup>2</sup> is a hydrogen atom or a lower alkyl group;

R<sup>3</sup> is (i) a hydrogen atom; (ii) a lower alkyl group which is optionally substituted by a nitrogen-containing heterocyclic group; or (iii) a heteroaryl group which is optionally substituted by a group selected from the group consisting of a hydroxy group, a halogen atom and a lower alkoxy group;

R<sup>4</sup> is (i) a hydrogen atom; (ii) a lower alkyl group; (iii) a carboxyl group esterified with a lower alkyl group; (iv) a carboxyl group amidated with a lower alkyl-substituted amino group which may be optionally substituted by a hydroxy group or a 5- to 6-membered nitrogen-containing heteromonocyclic group optionally substituted by a lower alkyl group; or (v) a carboxyl group amidated with a 5- to 6-membered nitrogen-containing heteromonocyclic group optionally substituted by a lower alkyl group;

R<sup>5</sup> is a lower alkyl group which may be optionally substituted by a group selected from the group consisting of (i) an aryl group optionally substituted by a group selected from the group consisting of a hydroxy group, a halogen atom and a lower alkoxy group;

(ii) a heteroaryl group optionally substituted by a group selected from the group consisting of a hydroxy group, a halogen atom and a lower alkoxy group; and

(iii) a di-lower alkylamino group; and

X is a group of the formula: =CH- and Y is a nitrogen atom, or X and Y are both nitrogen atoms,

or a pharmaceutically acceptable salt thereof.

22. (New) The compound according to claim 21, wherein X and Y are both nitrogen atoms.

23. (New) The compound according to claim 22, wherein the nitrogen-containing heterocyclic group for R<sup>1</sup> is a 5- or 6-membered nitrogen-containing heteromonocyclic group or a 8- to 10-membered nitrogen-containing heterobicyclic group, the aryl group for R<sup>5</sup> is a phenyl group and the heteroaryl group for R<sup>5</sup> is a pyridyl group or pyrimidyl group.

24. (New) The compound according to claim 23, wherein R<sup>5</sup> is a lower alkyl group which may be optionally substituted by a phenyl group optionally substituted by a group selected from the group consisting of a lower alkoxy group, a lower alkylendioxy group and a halogen atom, a pyridyl group or a pyrimidyl group, which groups are optionally substituted by a group selected from the group consisting of a lower alkoxy group and/or a halogen atom and a di-lower alkylamino group.

25. (New) The compound according to claim 24, wherein the nitrogen-containing heterocyclic group for R<sup>1</sup> is a 5- or 6-membered nitrogen-containing heteromonocyclic group selected from the group consisting of a pyrrolyl group, an oxazolyl group, a pyrazolyl group, a pyrrolinyl group, a pyrrolidinyl group, an imidazolyl group, a piperidyl group, a piperazinyl group, a morpholinyl group, a pyridyl group, a pyridazinyl group, a pyrimidinyl group, a pyrazinyl group and a triazinyl group, or an 8- to 10-membered nitrogen-containing heterobicyclic group selected from the group consisting of an indolyl group, an isoindolyl group, an indolydinyl group, a quinolyl group, an isoquinolyl group and a purinyl group; and the amidated carboxyl group for R<sup>4</sup> is a carboxyl group amidated with a lower alkyl-substituted amino group optionally substituted by a 5- to 6-membered nitrogen-containing heteromonocyclic group selected from the group consisting of a pyrrolyl group, an oxazolyl group, a pyrazolyl group, a

pyrrolinyl group, a pyrrolidinyl group, an imidazolyl group, a piperidyl group, a piperazinyl group, a morpholinyl group, a pyridyl group, a pyridazinyl group, a pyrimidinyl group, a pyrazinyl group, a triazinyl group, an imidazolidinyl group and a thiazolyl group, each group being optionally substituted by a lower alkyl group, or a carboxyl group amidated with a 5- to 6-membered nitrogen-containing heteromonocyclic group selected from the group consisting of a pyrrolyl group, an oxazolyl group, a pyrazolyl group, a pyrrolinyl group, a pyrrolidinyl group, an imidazolyl group, a piperidyl group, a piperazinyl group, a morpholinyl group, a pyridyl group, a pyridazinyl group, a pyrimidinyl group, a pyrazinyl group, a triazinyl group, an imidazolidinyl group and a thiazolyl group, each group being optionally substituted by a lower alkyl group.

26. (New) The compound according to claim 25, wherein the nitrogen-containing heterocyclic group for R<sup>1</sup> is a 5- or 6-membered nitrogen-containing heteromonocyclic group of the formula:

or a 8- to 10-membered nitrogen-containing heterobicyclic group of the formula:

R<sup>4</sup> is a hydrogen atom, a lower alkyl group or a carboxyl group amidated with a group selected from the group consisting of a lower alkyl-substituted amino group which may be optionally substituted by a group of the formula:

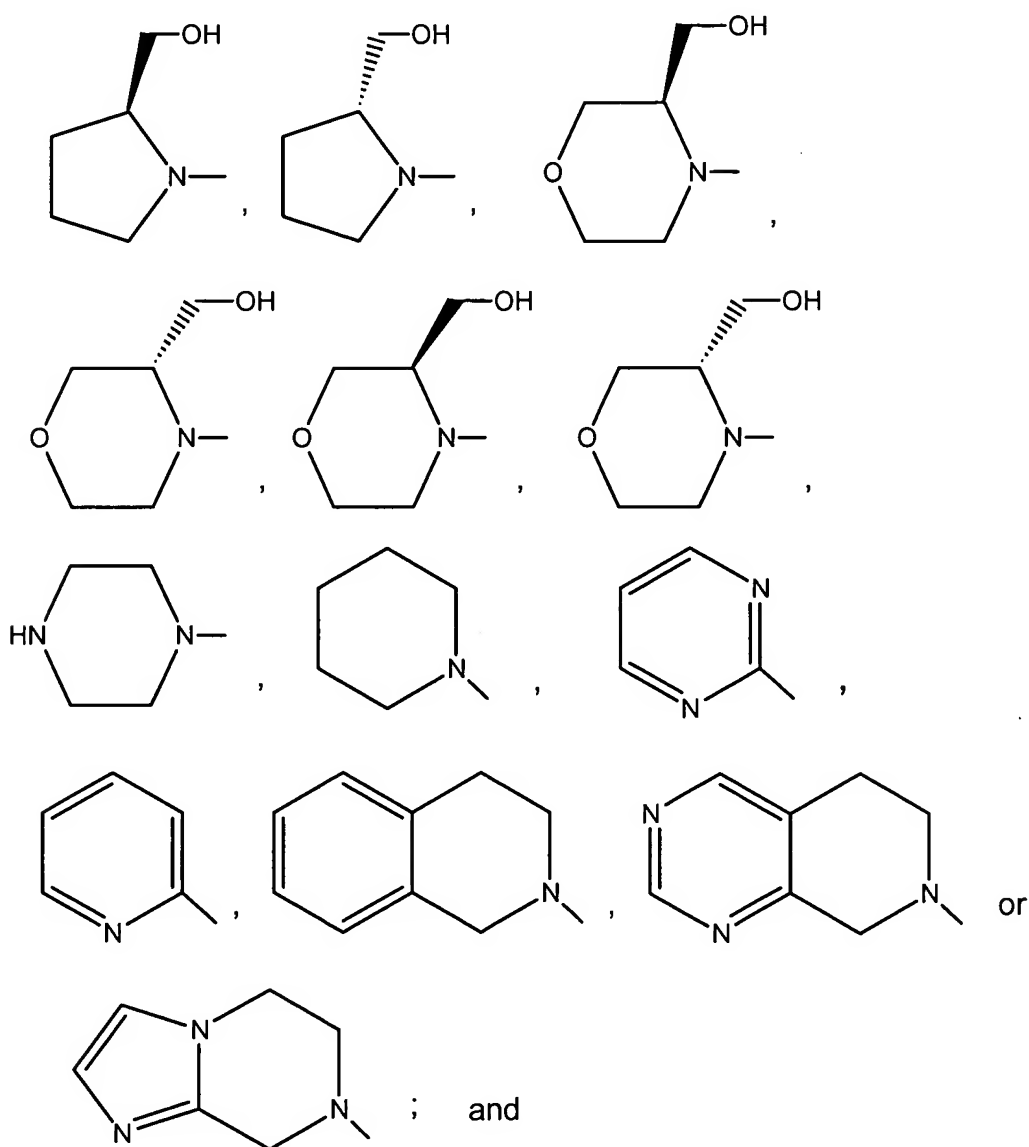
an amino group optionally substituted by a group of the formula:

which may be optionally substituted by a lower alkyl group, and

a group of the formula:

which may be optionally substituted by a lower alkyl group.

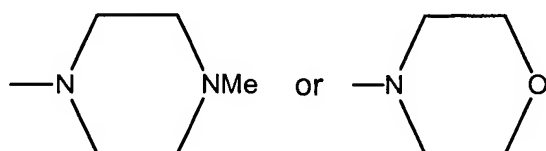
27. (New) The compound according to claim 26, wherein the nitrogen-containing heterocyclic group, which is optionally substituted by a lower alkyl group optionally substituted by a group selected from the group consisting of a hydroxy group, a halogen atom and a lower alkoxy group, for  $R^1$  is a group of the formula:



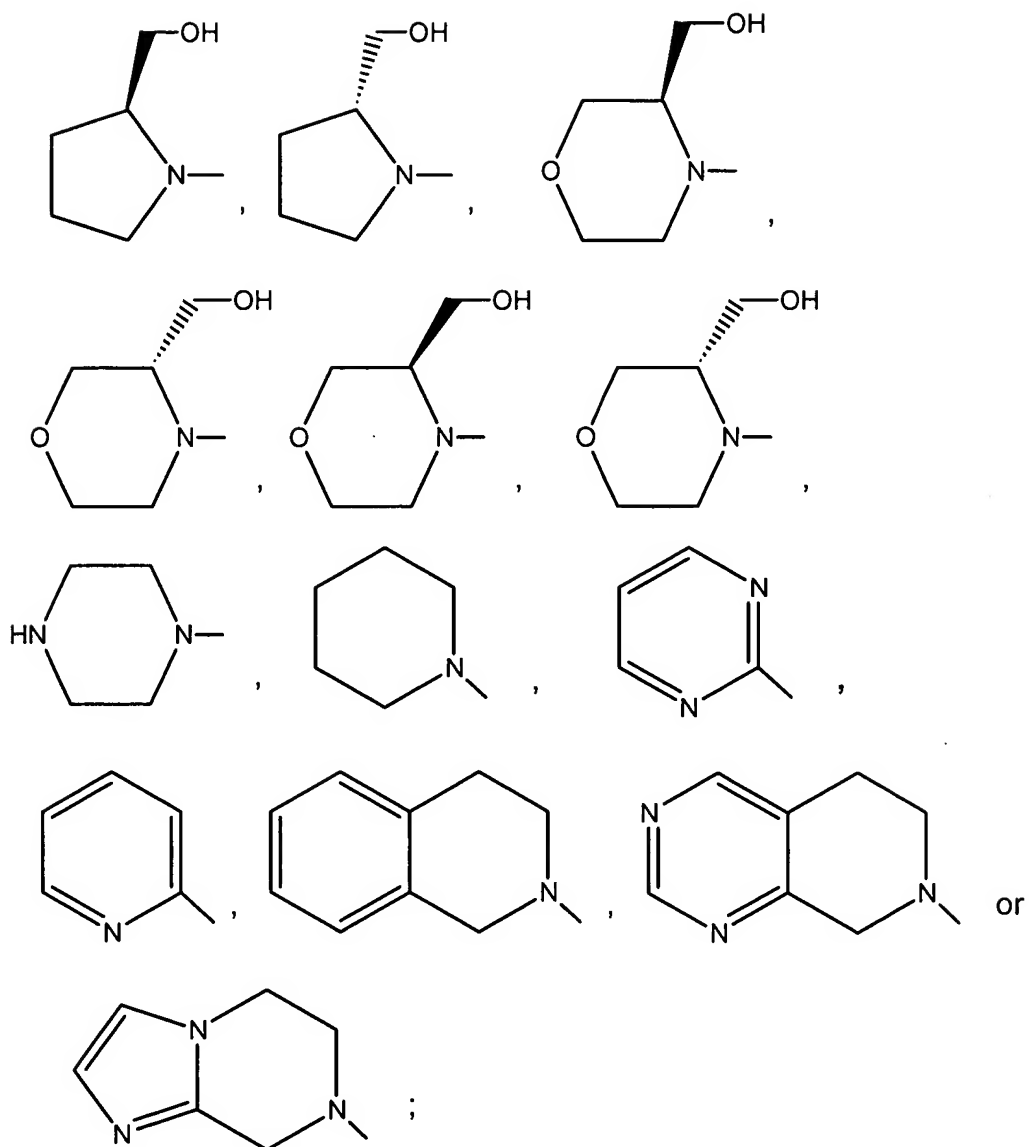
R<sup>4</sup> is a hydrogen atom, a lower alkyl group or a carboxyl group amidated with a group selected from the group consisting of a lower alkyl-substituted amino group optionally substituted by a group of the formula:

an amino group optionally substituted by a group of the formula:

a group of the formula:



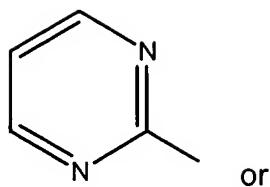
28. (New) The compound according to claim 27, wherein R<sup>1</sup> is a group of the formula:



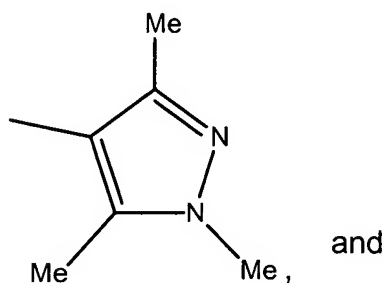
$R^2$  is a hydrogen atom;

$R^3$  is a hydrogen atom;

$R^4$  is a hydroxy group or a carboxyl group amidated with a lower alkyl-substituted amino group optionally substituted by a group of the formula:

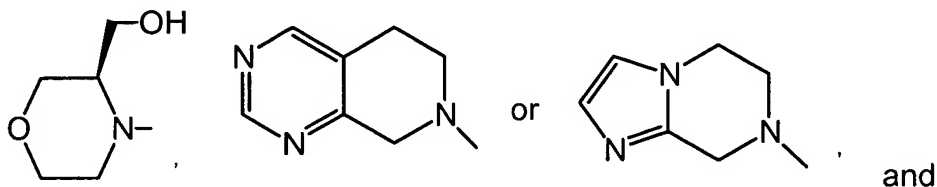


an amino group optionally substituted by a group of the formula:

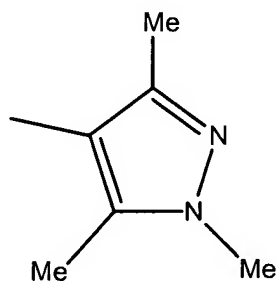


$R^5$  is a lower alkyl group substituted by a phenyl group optionally substituted by a lower alkoxy group and/or a halogen atom.

29. The compound according to claim 28, wherein  $R^1$  is a group of the formula:



$R^4$  is a carboxyl group amidated with a lower alkyl-substituted amino group optionally substituted by a group of the formula:





30. (New) (S)-2-(2-Hydroxymethyl-1-pyrrolidinyl)-5-[2-(4-morpholinyl) ethyl]-8-(3-chloro-4-methoxybenzyl)-7,8-dihydro-7-oxo-pyrido[2,3-d]pyrimidine;

(S)-2-(2-hydroxymethyl-1-pyrrolidinyl)-6-[N-{4-(1,3,5-trimethyl)pyrazolyl}carbamoyl]-8-(3-chloro-4-methoxybenzyl)-7,8-dihydro-7-oxo-pyrido[2,3-d]pyrimidine;

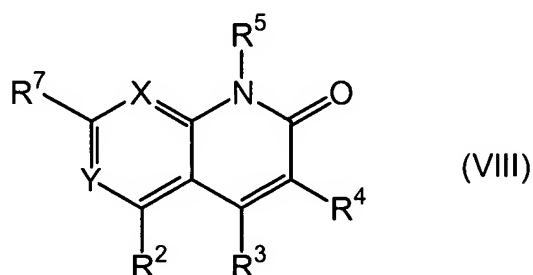
(S)-2-(2-hydroxymethyl-1-pyrrolidinyl)-8-(3-chloro-4-methoxybenzyl)-7,8-dihydro-7-oxo-pyrido[2,3-d]pyrimidine;

(S)-2-(2-hydroxymethyl-1-pyrrolidinyl)-5-methyl-8-(3-chloro-4-methoxybenzyl)-7,8-dihydro-7-oxo-pyrido[2,3-d]pyrimidine;

or a pharmaceutically acceptable salt thereof.

31. (New) (S)-2-(2-hydroxymethyl-1-pyrrolidinyl)-6-[N-{4-(1,3,5-trimethyl)pyrazolyl}carbamoyl]-8-(3-chloro-4-methoxybenzyl)-7,8-dihydro-7-oxo-pyrido[2,3-d]pyrimidine, or a pharmaceutically acceptable salt thereof.

32. (New) A pyridopyrimidine or a naphthyridine compound of the formula (VIII):



wherein  $R^7$  is a halogen atom or a group of the formula:



wherein  $R^9$  is a lower alkyl group or a phenyl group which may be optionally substituted by a group selected from the group consisting of a lower alkyl group, a hydroxy group, a halogen atom and a lower alkoxy group;

$R^2$  is a hydrogen atom or a lower alkyl group;

$R^3$  is (i) a hydrogen atom; (ii) a lower alkyl group which is optionally substituted by a nitrogen-containing heterocyclic group; or (iii) a heteroaryl group which is optionally substituted by a group selected from the group consisting of a hydroxy group, a halogen atom and a lower alkoxy group,

$R^4$  is (i) a hydrogen atom; (ii) a lower alkyl group; (iii) a carboxyl group esterified with a lower alkyl group; (iv) a carboxyl group amidated with a lower alkyl-substituted amino group which may be optionally substituted by a hydroxy group or a 5- to 6-membered nitrogen-containing heteromonocyclic group optionally substituted by a lower alkyl group; or (v) a carboxyl group amidated with a 5- to 6-membered nitrogen-containing heteromonocyclic group optionally substituted by a lower alkyl group,

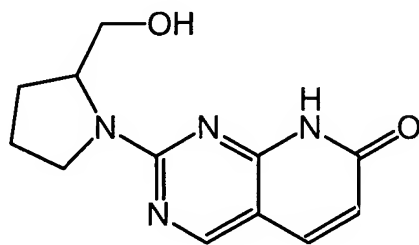
$R^5$  is a lower alkyl group which may be optionally substituted by a group selected from the group consisting of (i) an aryl group optionally substituted by a group selected from the group consisting of a hydroxy group, a halogen atom and a lower alkoxy group;

(ii) a heteroaryl group optionally substituted by a group selected from a hydroxy group, a halogen atom and a lower alkoxy group; and

(iii) a di-lower alkylamino group; and is a group of the formula:  $=CH-Y$  Y is a nitrogen atom, or

X and Y are both nitrogen atoms, or a salt thereof.

33. (New) A compound of the formula:



or a salt thereof.

34. (New) A pharmaceutical composition, which contains as an active ingredient a compound as set forth in any one of claims 21-33, or a pharmaceutically acceptable salt thereof.

35. (New) A method for the treatment of penile erectile dysfunction, which comprises administering to a patient in need thereof an effective amount of a compound as set forth in any one of claims 21-33, or a pharmaceutically acceptable salt thereof.

36. (New) A method for the treatment of pulmonary hypertension, which comprises administering to a patient in need thereof an effective amount of a compound as set forth in any one of claims 21-33, or a pharmaceutically acceptable salt thereof.

37. (New) A method for the treatment of diabetic gastroparesis, which comprises administering to a patient in need thereof an effective amount of a compound as set forth in any one of claims 21-33, or a pharmaceutically acceptable salt thereof.